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UDC 621·879·1 (First Reprint JANUARY 1989) **IS : 274 (Parts I and II) - 1981**

Indian Standard

REAFFIRMED
2003

SPECIFICATION FOR SHOVELS

PART I GENERAL PURPOSE SHOVELS
PART II HEAT-TREATED SHOVELS

(Third Revision)

PART I GENERAL PURPOSE SHOVELS

1. Scope — This part of the standard covers the requirements for shovels for general purposes.

2. Nomenclature — For the purpose of this standard, the nomenclature as given in Fig. 1 shall apply.

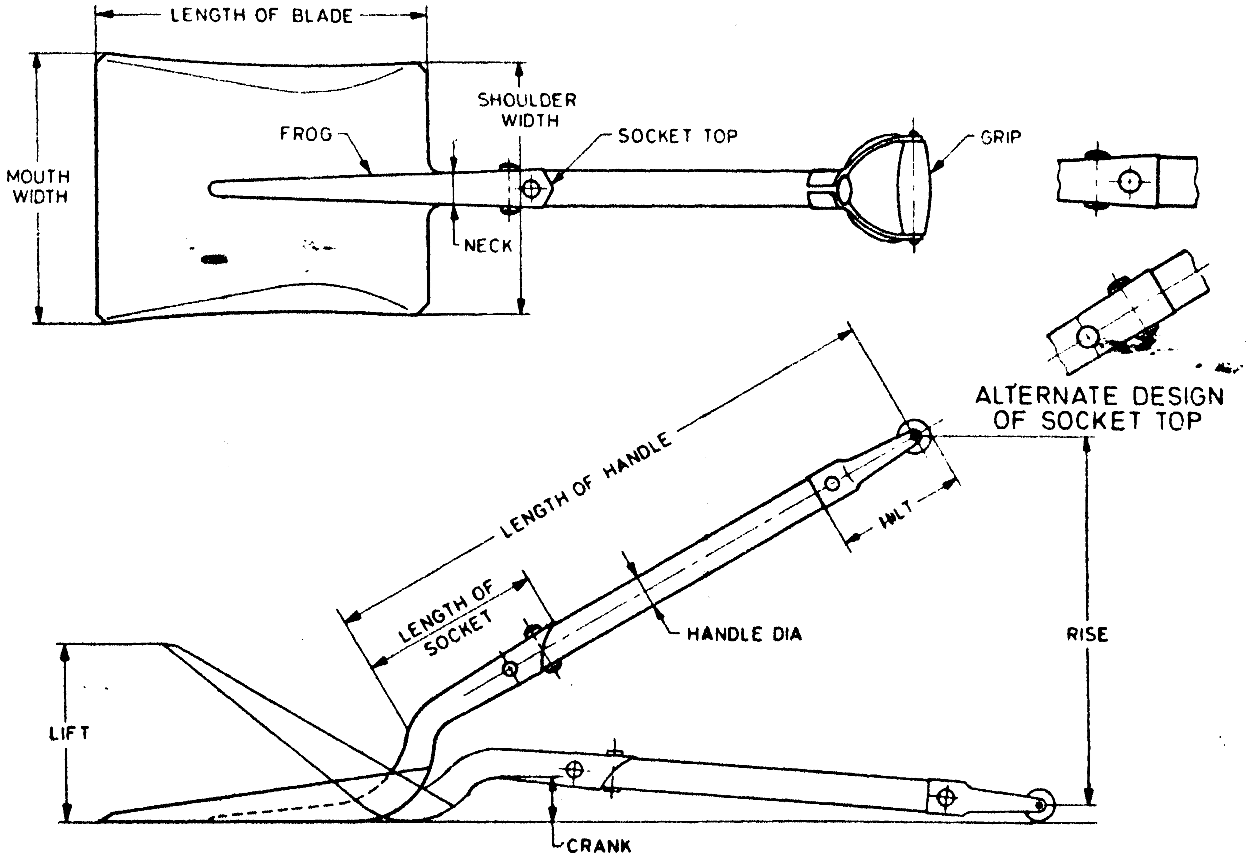

FIG. 1 NOMENCLATURE FOR SHOVELS

3. Types — The general purpose shovels shall be of the following two types:

a) Square nose shovel, and

b) Round nose shovel.

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Hand Tools Sectional Committee, EDC 12; Earthwork Tools Subcommittee, EDC 12:1 [Ref : Doc : EDC 12 (3581)]

4. Material

4.1 The shovel blades shall be manufactured from any suitable quality steel sheet meeting the requirements laid down in **14**. Some of the suitable steels for this purpose are T-50, T-55 and T-60 of Schedule VI of IS : 1570-1961 'Schedules for wrought steel for general engineering purposes' with maximum sulphur and phosphorus content of 0·06 percent each.

4.2 *Rivets and Pins* — The rivets or pins shall be manufactured from mild steel. The clasps and crutches (*see* IS : 2897-1965 Specification for wooden handles for shovels) shall be manufactured from suitable quality steel.

5. Shapes and Dimensions — The shape and main dimensions of the square nose and round nose shovels shall be as given in Tables 1 and 2.

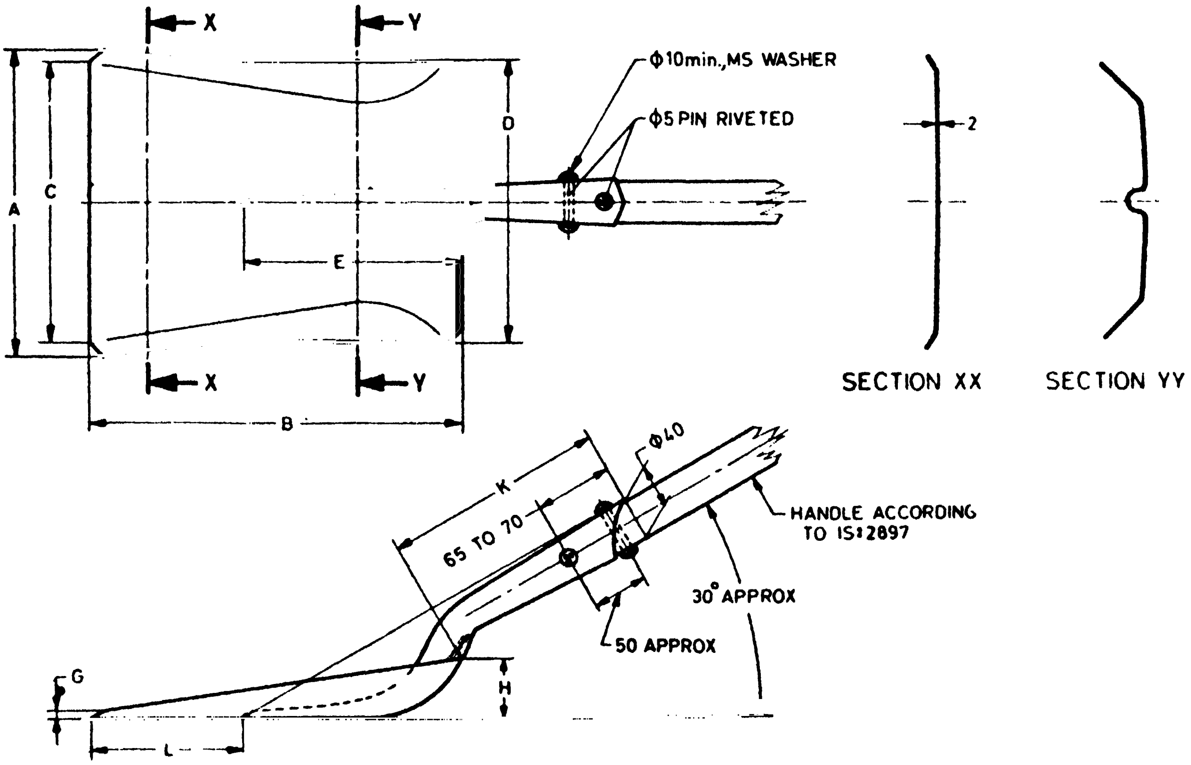
6. Tolerances — The permissible tolerances on the essential dimensions of shovels shall be as indicated in Tables 1 and 2.

6.1 The permissible tolerance on the thickness of the blade shall be ±10 percent.

TABLE 1 DIMENSIONS FOR SQUARE NOSE SHOVELS

(*Clauses* 5, 6, 8 *and* 9.3 of Part I, and 5.1 of Part II)

All dimensions in millimetres.



A ±6	*B* ±6	*C* ±6	*D* ±6	*E* (Nom)	*G* (Nom)	*H* ±3	*K* +6 −0	*L* (Nom)	Nominal Mass of Blade kg
280	340	255	255	200	6	55	200	140	1·8
305	370	280	280	200	6	60	200	170	2

AMENDMENT NO. 3 JUNE 2003
TO
IS 274 (Parts 1 and 2) : 1981 SPECIFICATION FOR SHOVELS

PART 1 GENERAL PURPOSE SHOVELS

PART 2 HEAT-TREATED SHOVELS

(Third Revision)

Corrigendum to Amendment No. 2

[*Amendment No.* 2 *August* 1986, *Page* 1, *last sentence*) — Substitute the following for the existing sentence:

(*Page* 7, *Table* 1) — Substitute $\begin{array}{c}\text{‘}\boldsymbol{G}\text{’}\\ (\,\boldsymbol{\textit{Nom}}\,)\end{array}$ *for* $\begin{array}{c}\text{‘}\boldsymbol{G}\text{’}\\ \mathbf{+3}\\ \mathbf{-0}\end{array}$

(BP 06)

Reprography Unit, BIS, New Delhi, India

AMENDMENT NO. 2 AUGUST 1986
TO
IS:274(Parts 1 and 2)-1981 SPECIFICATION FOR SHOVELS
PART 1 GENERAL PURPOSE SHOVELS
PART 2 HEAT-TREATED SHOVELS

(Third Revision)

(*Page 2, Table 1*) - Substitute '$\underset{(Nom)}{H}$' *for* '$\underset{\pm 3}{H}$'.

(*Page 2, Table 1 and Page 3, Table 2*):-

i) In the figures, delete '*min*' from '**ϕ10 min., MS WASHER**'.

ii) Add the following foot-note below the Tables:

> 'NOTE - While riveting at metal to metal contact, provision of MS Washer is optional.

(*Page 4, clause 13, line 2*) - Substitute the following for the existing matter:

"IS:8910-1978 'General technical delivery requirements for steel and steel products'."

(*Page 4, clause 14.3, last sentence*) - Substitute the following for the existing sentence:

'This test shall be repeated three times and on completion of test, the blade shall show no sign of bending or crack.'

(*Page 7, Table 1*) - Substitute '$\underset{(Nom)}{C}$' *for* '$\underset{\substack{+3\\-0}}{G}$'.

(*Page 7, Table 1; and Page 8, Table 2*):

i) In the figures, delete '*min*' from 'ϕ10 min **MS WASHER**'.

ii) Add the following foot-note below the tables:

'NOTE - While riveting at metal to metal contact, provision of MS Washer is optional.

(*Page 8, clause 14, line 2*) - Substitute the following for the existing matter:

"IS:8910-1978 'General technical delivery requirements for steel and steel products'."

(*Page 9, clause 15.3, last sentence*) - Substitute the following **for the existing matter:**

'The test shall be repeated three times and on completion of the test, the blade shall show no sign of bending or crack.'

(EDC 12)

AMENDMENT NO. 1 OCTOBER 1983
TO
IS:274(Parts I and II)-1981 SPECIFICATION FOR SHOVELS

(Third Revision)

PART I GENERAL PURPOSE SHOVELS

Alterations

(Pages 2 and 3, figures under Tables 1 and 2, dimensions) - Substitute '65 To 75' *for* '65 To 70'

(Page 3, clause 6.2) - Delete.

PART II HEAT TREATED SHOVELS

Alterations

(Pages 7 and 8, figures under Tables 1 and 2, dimensions) - Substitute '65 To 75' *for* '65 To 70'

(Page 6, clause 6.2) - Delete.

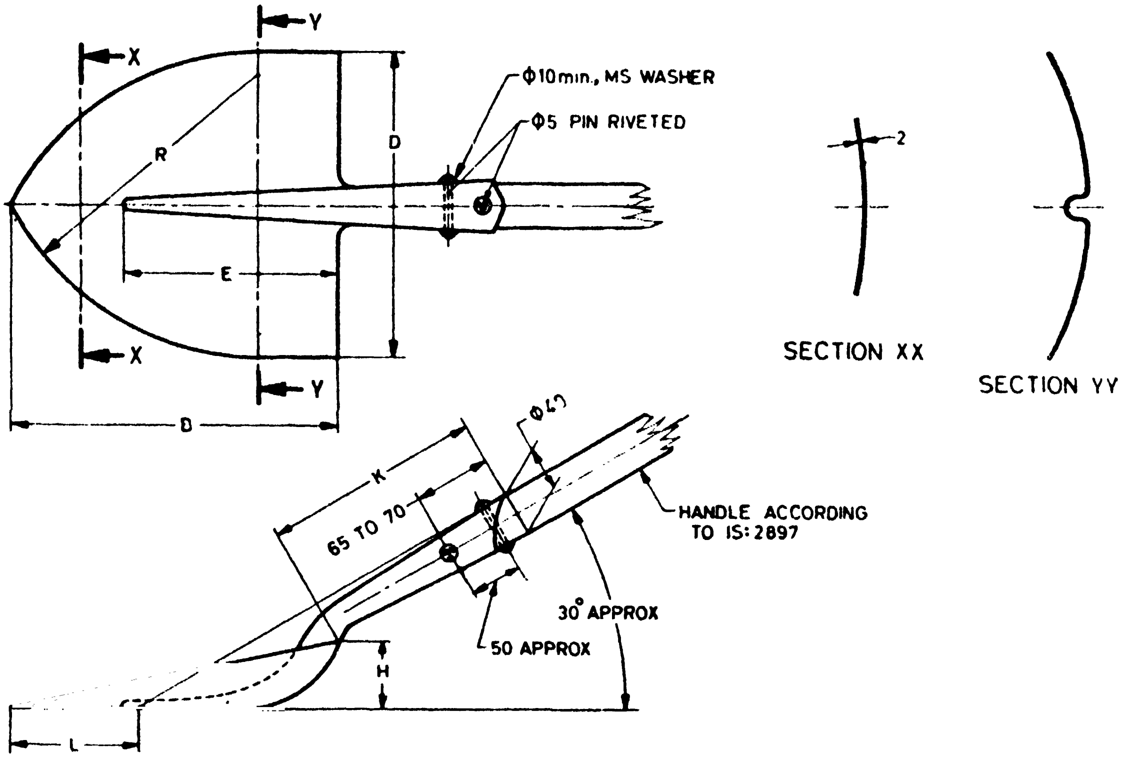
(EDC 12)

Reprography Unit, BIS, New Delhi, India

TABLE 2 DIMENSIONS FOR ROUND NOSE SHOVELS

(*Clauses* 5, 6, 8 *and* 9.3 of Part I, and 5.1, of Part II)

All dimensions in millimetres.



B ±6	D ±6	E *(Nom)*	H *(Nom)*	K +6 −0	L *(Nom)*	R *(Nom)*	Nominal Mass of Blade kg
330	275	200	60	200	155	255	1·6

6.2 The tolerances on non-essential dimensions shall be in accordance with IS : 2102-1969 'Allowable deviations for dimensions without specified tolerances (*first revision*) '.

7. Mass — The mass of the blades shall be as given in the respective tables subject to a tolerance of ± 10 percent.

8. Manufacture — Each blade (inclusive of the socket) shall be made in one piece without any welded or riveted joint. The tip of the socket may be slightly rounded at the option of the manufacturer. Two holes for riveting the handle to the shovel shall be provided, one at a distance of 65 to 75 mm from the tip/end of the socket, the axis of which shall be approximately at the right angles to the axis of the handle and parallel to the face of the blade as shown in Tables 1 and 2 and the second hole at approximately right angles to the first hole at a distance of about 50 mm from it towards the tip/end of the socket.

9. Handles

9.1 Shovels shall be supplied complete with handles unless it is specifically mentioned in the order that only shovel blades are required.

9.2 In case shovels are required to be supplied with handles, the handles shall conform to IS : 2897-1965 'Specification for wooden handles for shovels' or otherwise, as agreed to between the buyer and the manufacturer.

9.3 The wooden handles shall be driven fully into the socket and neatly secured by two rivets as shown in Tables 1 and 2.

10. Designation — The shovels shall be designated by:

a) Commonly used name,
b) Nominal mass of blade, and
c) Number of this standard.

Example:

A square nose general purpose shovel having nominal mass of blade 1·8 kg without handle shall be designated as:

Square Nose Shovel 1·8 kg IS : 274 (Part I)

11. Workmanship and Finish — The blades shall be well formed and cleanly made. They shall be reasonably free from seams, splits, cracks and other defects. The edges shall be reasonably smooth.

12. Preservative Treatment — The exposed metal portion of the shovel shall be varnished or coated with a suitable anti-corrosive paint.

13. Supply of Shovels — General requirements relating to the supply of shovels shall conform to IS : 1387-1967 'General requirements for the supply of metallurgical materials (*first revision*)'.

14. Sampling and Tests

14.1 Samples not exceeding two percent of any batch and not less than two shovel of each type, if the batch is less than 100, shall be selected at random by the purchaser, or his authorized representative for testing purposes. In case shovels are supplied with handles, such sampling shall be done after the handles are fitted to the blades, and prior to preservative treatment of the blade.

14.2 *Bending Test* — The shovel blade shall be securely fixed, as shown in Fig. 2 with its face upwards in horizontal position, up to about half the length of the blade. A vertical load of 500 N (50 kg approx) shall be gradually applied in downward direction at the end of the handle. The load shall be maintained for one minute and during loading the handle shall not break, or the rivets get removed. On removal of the load, the permanent set at the extreme end of the shovel handle shall not exceed 100 mm.

14.3 *Flexing Test* — The shovel blade shall be securely fixed up to position of about 40 mm measured from the nose of the blade as shown in Fig. 3 with its face upwards in the horizontal position. The unsecured parts of the shovel blade shall be flexed through an angle of 5° to 10° by a suitable force in upward direction at the free end of the handle and then released. This test shall be repeated three times and on completion of the test, the blade shall show no sign of permanent set, damage or defect.

14.4 *Retest* — Should any sample fail under test, two further samples shall be subjected to the tests. If either of the retest samples fail, the bulk represented shall be rejected unless the defect is considered by the manufacturer as rectifiable.

15. Marking — Each shovel shall be clearly, legibly and indelibly marked either on the socket or on the upper half of the blade with its type and/or nominal mass and manufacturer's name, initial and/or trade-mark.

15.1 *Certification Marking* — Details available with the Bureau of Indian Standards.

16. Packing — The shovels shall be securely packed in suitable packing cases or crates, of a size convenient for handling in transit or bundled and secured suitably with wire, as may be specified by the purchaser. Each type and size of the shovel shall be kept separate when packed and no packages/bundles shall contain more than one variety of shovels.

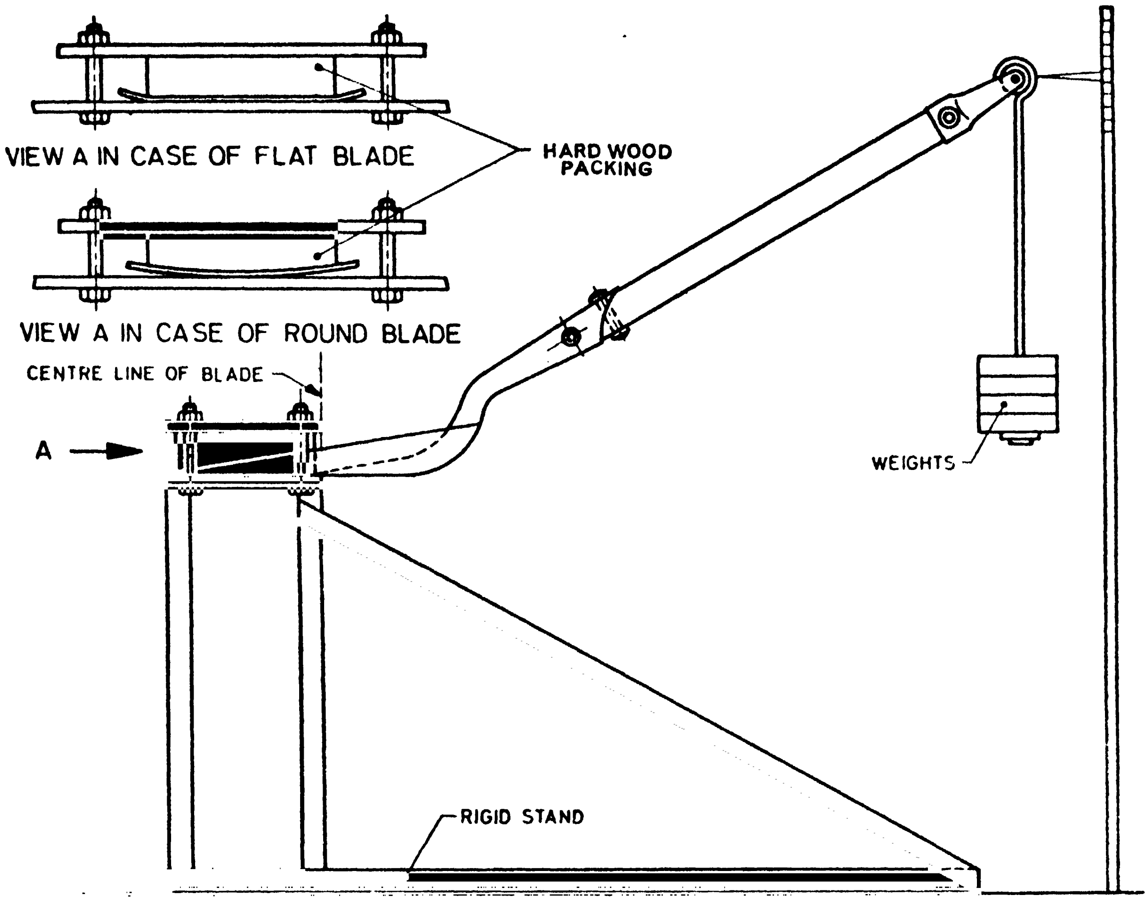


FIG. 2 TEST SET-UP FOR BENDING TEST

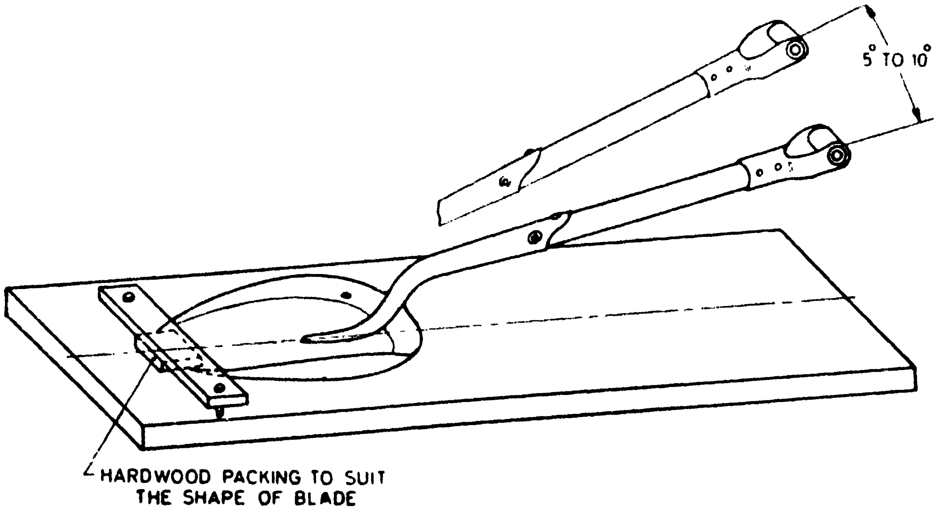


FIG. 3 TEST SET-UP FOR FLEXING TEST

PART II HEAT-TREATED SHOVELS

1. Scope — This part of the standard covers the requirements for heat-treated shovels.

2. Nomenclature — For the purpose of this standard, the nomenclature as given in Fig. 1 of Part I shall apply.

3. Types — The heat-treated shovels shall be of the following four types:

a) Square nose shovels,
b) Round nose shovels,
c) Long blade firing shovels, and
d) Short blade firing shovels.

4. Material

4.1 The shovel blades shall be manufactured from any suitable quality steel sheet meeting with the requirements laid down in **9** and **15**. Some of the suitable steels for this purpose are T-50, T-55 and T-60 of Schedule VI of IS : 1570-1961 'Schedules for wrought steels for general engineering purposes' with maximum sulphur and phosphorus content of 0·06 percent each.

4.2 *Rivets and Pins* — The rivets or pins shall be manufactured from mild steel. The clasps and crutches (*see* IS : 2897-1965 Specification for wooden handles for shovels) shall be manufactured from suitable quality steel.

5. Shapes and Dimensions

5.1 The shape and main dimensions of square nose and round nose shovels (heat-treated) shall be as indicated in Tables 1 and 2 of Part I.

5.2 The shape and main dimensions of long blade and short blade firing shovels shall be as given in Tables 1 and 2 of Part II.

6. Tolerances — The permissible tolerance on the essential dimensions of shovels shall be as indicated in Tables 1 and 2 of Part II.

6.1 The permissible tolerance on the thickness of the blades shall be ±10 percent.

6.2 The tolerances on non-essential dimensions shall be in accordance with IS : 2102-1969 'Allowable deviations for dimensions without specified tolerances (*first revision*)'.

7. Mass — The mass of the blades shall be as given in respective tables subject to tolerances of ±10 percent.

8. Manufacture — Each blade (inclusive of the socket) shall be made in one piece without any welded or riveted joint. The tip of the socket may be slightly rounded at the option of the manufacturer. Two holes for riveting the handle to the shovel shall be provided one at a distance of 65 to 75 mm from the tip/end of the socket, the axis of which shall be approximately at right angles to the axis of the handles and parallel to the face of the blade as shown in Tables 1 and 2 of Part II and the second hole at approximately right angle to the first hole at a distance of about 50 mm from it towards the tip/end of the socket.

9. Hardness — The shovel blades shall be hardened from the working edge up to the distance of 50 mm away and parallel to the shoulder. The hardness value shall be within the range of 370 to 480 HV (38 to 48 HRC approx).

10. Handles

10.1 Shovels shall be supplied complete with handles unless it is specifically mentioned in the order that only the shovel blades are required.

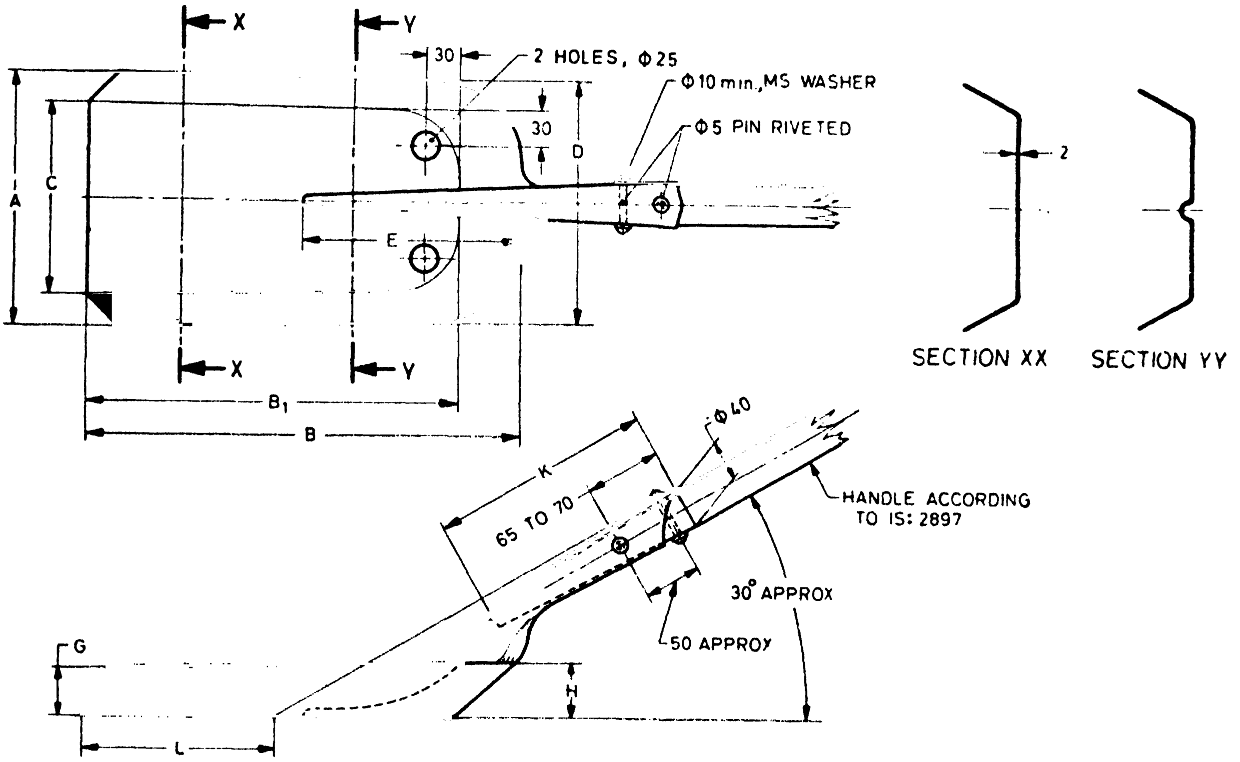
10.2 In case shovels are required to be supplied with handles, the handles shall conform to IS : 2897-1965 or otherwise as agreed to between the buyer and the manufacturer.

10.3 The wooden handles shall be driven fully into the socket and neatly secured by two rivets as indicated in respective tables.

TABLE 1 DIMENSIONS FOR LONG BLADE FIRING SHOVELS

(*Clauses* 5.2, 6 *and* 8 of Part II)

All dimensions in millimetres.



A ±6	*B* ±6	*B_1* ±6	*C* ±6	*D* ±6	*E* (Nom)	*G* +3 −0	*H* (Nom)	*K* ±6	*L* (Nom)	Nominal Mass of Blade kg
230	400	340	175	220	200	45	50	200	175	2

11. Designation — The shovels shall be designated by:

a) Commonly used name,

b) Nominal mass of blade, and

c) Number of the standard.

Example:

A square-nose shovel (heat-treated) having nominal mass of blade 1·8 kg without handle shall be designated as:

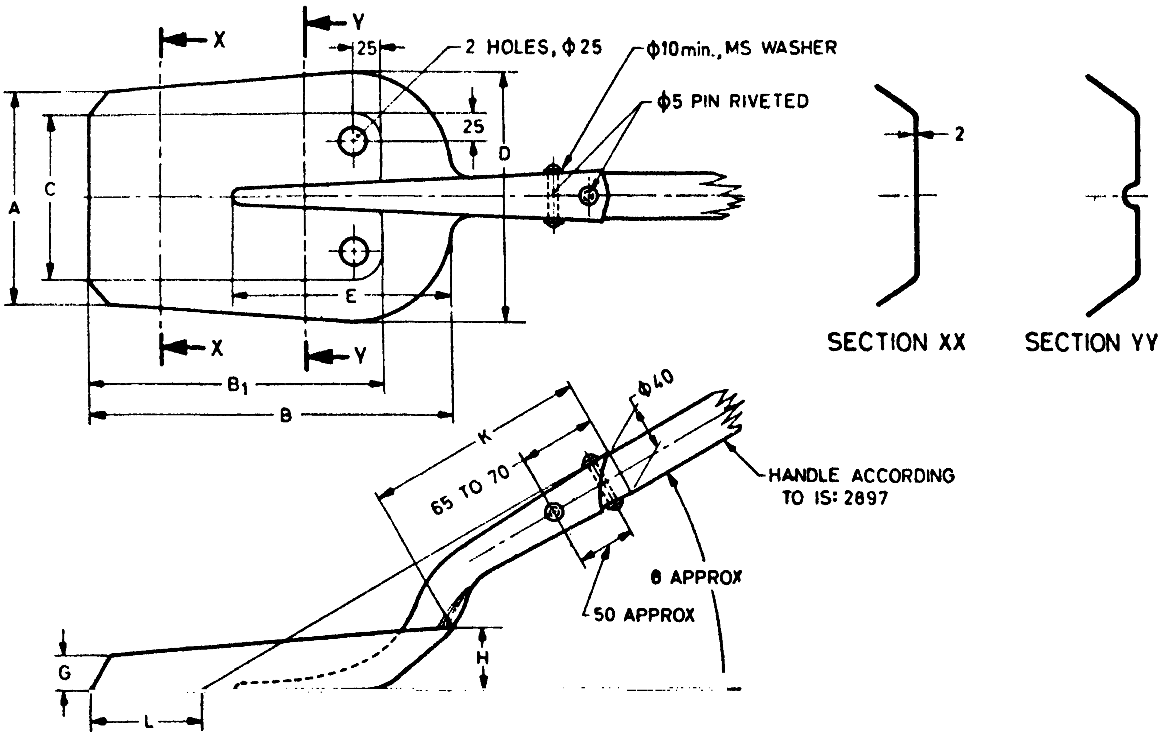
Square-Nose shovel 1·8 kg IS : 274 (Part II)

12. Workmanship and Finish — The blades shall be well formed and cleanly made. They shall be reasonably free from seams, splits, cracks and other defects. The edges shall be reasonably smooth.

TABLE 2 DIMENSIONS FOR SHORT BLADE FIRING SHOVELS

(*Clauses* 5.2, 6 *and* 8 of Part II)

All dimensions in millimetres.



A ±6	*B* ±6	*B*$_1$ ±6	*C* ±6	*D* ±6	*E* (*Nom*)	*G* +3 −0	*H* (*Nom*)	*K* ±6	*L* (*Nom*)	θ	Nominal Mass of Blade kg
165	300	230	125	220	200	15	45	200	0	16°	1·25
190	330	265	150	230	200	30	55	200	100	30°	1·5

13. Preservative Treatment — The exposed metal portion of the shovel shall be varnished or coated with a suitable anti-corrosive paint.

14. Supply of Shovels — General requirements relating to the supply of shovels shall conform to IS : 1387-1967 ' General requirements for the supply of metallurgical materials (*first revision*) '.

15. Sampling and Tests

15.1 Samples not exceeding two percent of any batch and not less than two shovels of each type, if the batch is less than 100, shall be selected at random by the purchaser or his authorized representative. In case shovels are supplied with handles, such sampling should be done after the handles are fitted to the blades, and prior to preservative treatment of the blade.

15.2 *Bending Test* — The shovel blade shall be securely fixed, as shown in Fig. 2 of Part I of this specification with its face upwards in horizontal position up to about half the length of the blade. A vertical load of 500 N (50 kg approx) shall be gradually applied in downward direction at the end of the handle. The load shall be maintained for one minute, and during loading the handle shall not break, or the rivets get removed. On removal of the load, the permanent set at the extreme end of the shovel handle shall not exceed 13 mm.

15.3 *Flexing Test* — The shovel blade shall be securely fixed up to a position of about 40 mm measured from the nose of the blade, as shown in Fig. 3 of Part I of this specification, with its face upwards in the horizontal position. The unsecured part of the shovel blade shall be flexed through an angle of 5° to 10° by a suitable force in upward direction at the end of the handle and then released. This test shall be repeated three times and on completion of the test, the blade shall show no sign of permanent set, damage or defect.

15.4 *Retest* — Should any sample fail under test, two further samples shall be subjected to the tests. If either of the retest samples fail, the bulk represented shall be rejected unless the defect is considered by the manufacturer as rectifiable.

16. Marking — Each shovel shall be clearly, legibly and indelibly marked either on the socket or on the upper half of the blade with its type and/or nominal mass, manufacturer's name, initial and/or trade-mark.

16.1 *ISI Certification Marking* — Details available with the Indian Standards Institution.

17. Packing — The shovels shall be securely packed in suitable packing cases or crates, of a size convenient for handling in transit, or bundled and secured suitably with wire, as may be specified by the purchaser. Each type and size of the shovel shall be kept separate when packed and no packages/bundles shall contain more than one type of shovels.

EXPLANATORY NOTE

This standard was first published in 1951 and revised in 1961 and 1966. Third revision of this standard has been taken up to bring it in line with the present manufacturing practices prevailing in the Indian industry. In this revision, the following changes have been effected:

a) Tolerance on thickness of the blade has been specified;

b) Tolerance on mass of the blade has been modified;

c) Marking has also been permitted on upper part of the blade for ease of identification;

d) Hardness of blades for heat-treated shovels has been modified as given in BS 3385 : 1961 'Specification for shovels', issued by the British Standards Institution (BSI); and

e) The requirement for retest has been modified so as to permit the rectification of such defects as are considered rectifiable by the manufacturer and permitting for reinspection.